Listing of Claims:

1. (Currently Amended) A 3D image acquisition apparatus comprising:

a pattern projection section which projects a predetermined pattern on an object;

an imaging section which is ~~disposed~~ positioned at a predetermined distance from said pattern projection section and which images the object ~~on which~~ having the predetermined pattern ~~has been~~ projected thereon; and

a depth calculation section which detects the ~~projection~~ projected pattern projected on the object based on ~~the basis of~~ an image acquired by said imaging section, collates the detected ~~projection~~ projected pattern and the predetermined pattern ~~projected by the pattern projection section~~, and calculates a depth of respective parts of the object based on the basis of ~~the correspondency of~~ the collation,

wherein the predetermined pattern ~~projected by said pattern projection section is formed by alternately arranging~~ includes local maximum areas with local maximum luminance values and local minimum areas with local minimum luminance values, wherein a total number of the local maximum luminance values and the local minimum luminance values is at least three, and wherein the local maximum areas are arranged alternately with the local minimum

areas to encode the predetermined pattern based on the arrangement of the local maximum areas and the local minimum areas and the luminance values corresponding to the respective local maximum areas and the respective local minimum areas.

2. (Currently Amended) A 3D image acquisition apparatus comprising:

a pattern projection section which projects a predetermined pattern on an object;

an imaging section which is ~~disposed~~ positioned at a predetermined distance from said pattern projection section and which images the object ~~on which~~ having the predetermined pattern ~~has been~~ projected thereon; and

a depth calculation section which detects an image pattern based on ~~the basis of~~ an image acquired by said imaging section, collates the detected image pattern and the predetermined pattern ~~projected by the pattern projection section~~, and calculates a depth of respective parts of the object based on ~~the basis of the correspondency of~~ the collation,

wherein the predetermined pattern ~~projected by said pattern projection section is formed by combining~~ includes patterns of a plurality of color components, and the ~~patterns~~ pattern of each of the plurality of color components ~~are formed by alternately arranging~~ includes local maximum areas with local maximum

luminance values and local minimum areas with local minimum luminance values, wherein in the pattern of each of the plurality of color components a total number of the local maximum luminance values and the local minimum luminance values is at least three, and wherein the local maximum areas are arranged alternately with the local minimum areas to encode the pattern of each of the plurality of color components based on the arrangement of the local maximum areas and the local minimum areas and the luminance values corresponding to the respective local maximum areas and the respective local minimum areas.

3. (Currently Amended) A 3D image acquisition apparatus according to claim 2, wherein in the patterns of each of the plurality of color components, positions of the local maximum areas ~~with local maximum luminance values~~ and positions of the local minimum areas ~~with local minimum luminance values~~ are ~~aligned~~ the same.

4. (Currently Amended) A 3D image acquisition apparatus according to claim 2, wherein in the patterns two of the plurality of color components, positions of the local maximum areas ~~with local maximum luminance values~~ and positions of the local minimum areas ~~with local minimum luminance values~~ are ~~shifted~~ different.

5. (Currently Amended) A 3D image acquisition apparatus according to claim 2, wherein ~~the position~~ positions of the ~~area with the~~ local maximum ~~luminance of~~ areas in the pattern of at least one of the plurality of color components ~~is aligned with the position~~ are the same as positions of the ~~area with the~~ local minimum ~~luminance of~~ areas in the patterns of the ~~other~~ others of the plurality of color components.

6. (Previously Presented) A 3D image acquisition apparatus according to claim 2, wherein said plurality of color components are RGB components.

7. (Currently Amended) A 3D image acquisition apparatus according to claim 1, wherein the ~~projected~~ predetermined pattern is one of a stripe pattern ~~or~~ and a matrix pattern.

8. (Currently Amended) A 3D image acquisition apparatus comprising:

a pattern projection section which projects ~~on an object~~ a spatial encoding pattern ~~in which blocks or areas with local maximum and minimum luminance values are alternately arranged and encoding is effected by combining local maximum/minimum information and gradation information~~ onto an object;

a pattern memory which stores the spatial encoding pattern ~~that is projected by the pattern projection section;~~

~~a~~ at least one light reception section which receives light reflected by the object;

~~an~~ at least one image memory which stores information ~~of~~ corresponding to the light received by the light reception section;

a depth calculation section which calculates depth information of the object based on the ~~basis of the~~ pattern of the image information stored in the image memory and the spatial encoding pattern stored in the pattern memory;

a 2D image information generating section which generates 2D image information based on ~~the basis of~~ the information stored in the image memory; and

a 3D image generating section which generates a 3D image based on ~~the basis of~~ the 2D image information generated by the 2D image information generating section and the depth information calculated by the depth calculation section;

wherein the spatial encoding pattern includes local maximum areas with local maximum luminance values and local minimum areas with local minimum luminance values, wherein a total number of the local maximum luminance values and the local minimum luminance values is at least three, and wherein the local maximum areas are arranged alternately with the local minimum areas to

encode the predetermined pattern based on the arrangement of the local maximum areas and the local minimum areas and the luminance values corresponding to the respective local maximum areas and the respective local minimum areas.

9. (Currently Amended) A 3D image acquisition apparatus according to claim 8, wherein said ~~3D image acquisition apparatus has~~ at least one light reception section comprises a plurality of ~~said~~ light reception sections and said at least one image member comprises a plurality of ~~said~~ image memories, ~~and~~

wherein said 3D image acquisition apparatus further ~~includes~~ comprises a correspondency determination section which matches ~~the contents of~~ and collates the image information in the image memories ~~and collates the images~~,

wherein the depth calculation section calculates ~~3D~~ the depth information of the object based on ~~the basis of information determined by~~ an output of the correspondency determination section, and

wherein said 3D image section generates a 3D image based on ~~the basis of information generated by~~ the 2D image information ~~generating section~~ and the ~~value~~ depth information calculated by the depth calculation section.

10. (Currently Amended) A 3D image acquisition method comprising:

~~a step of~~ projecting a predetermined pattern on an object;

~~a step of imaging~~ acquiring an image of the object ~~on which~~ having the predetermined pattern ~~has been~~ projected thereon, at a position ~~at~~ that is a predetermined distance from a position ~~where the predetermined pattern has been projected~~ of the object; and

~~a step of~~ detecting ~~a~~ the projected pattern based on the ~~basis of an~~ acquired image ~~acquired by said imaging step~~ of the object; [[,]]

collating the detected pattern and the predetermined pattern; ~~projected by said pattern projection step,~~ and

calculating a depth of respective parts of the object based on ~~the basis of the correspondency of~~ the collation; [[,]]

wherein the predetermined pattern ~~projected by said pattern projection step is formed by alternately arranging~~ includes local maximum areas with local maximum luminance values and local minimum areas with local minimum luminance values, wherein a total number of the local maximum luminance values and the local minimum luminance values is at least three, and wherein the local maximum areas are arranged alternately with the local minimum areas to encode the predetermined pattern based on the arrangement of the local maximum areas and the local minimum

areas and the luminance values corresponding to the respective local maximum areas and the respective local minimum areas.

11. (Currently Amended) A 3D image acquisition method comprising:

~~a step of~~ projecting a predetermined pattern on an object;

~~a step of imaging~~ acquiring an image of the object ~~on which~~ having the predetermined pattern ~~has been~~ projected thereon, at a position ~~at~~ that is a predetermined distance from a position ~~where the predetermined pattern has been projected~~ of the object; and

~~a step of~~ detecting ~~a~~ the projected pattern based on the ~~basis of an~~ acquired image ~~acquired by said imaging step~~ of the object; [[,]]

collating the detected pattern and the predetermined pattern; ~~projected by said pattern projection step,~~ and

calculating a depth of respective parts of the object based on ~~the basis of the correspondency of~~ the collation; [[,]]

wherein the predetermined pattern ~~projected by said pattern projection step is formed by combining~~ includes patterns of a plurality of color components, and the ~~patterns~~ pattern of each of the plurality of color components ~~are formed by alternately arranging~~ includes local maximum areas with local maximum luminance values and local minimum areas with local minimum

luminance values, wherein in the pattern of each of the plurality of color components a total number of the local maximum luminance values and the local minimum luminance values is at least three, and wherein the local maximum areas are arranged alternately with the local minimum areas to encode the pattern of each of the plurality of color components based on the arrangement of the local maximum areas and the local minimum areas and the luminance values corresponding to the respective local maximum areas and the respective local minimum areas.

12. (Currently Amended) A method for encoding a spatial pattern for 3D image acquisition ~~method, to which applied is~~ said method comprising:

generating a spatial encoding pattern ~~encoding method wherein blocks or areas with~~ including local maximum areas with local maximum luminance values and local minimum areas with local minimum luminance values, wherein a total number of the local maximum luminance values and the local minimum luminance values is at least three; and ~~are alternately arranged and a predetermined code pattern is generated by combining local maximum/minimum information and gradation information~~

alternately arranging the local maximum areas with the local minimum areas to encode the predetermined pattern based on the arrangement of the local maximum areas and the local minimum

areas and the luminance values corresponding to the respective local maximum areas and the respective local minimum areas.

13. (Currently Amended) A ~~3D image acquisition~~ method according to claim 12, wherein the ~~code~~ spatial encoding pattern ~~obtained by the spatial pattern encoding method~~ is one of a stripe pattern ~~or~~ and a matrix pattern.

14. (Currently Amended) A ~~3D image acquisition~~ method according to claim 12, wherein the ~~code~~ spatial encoding pattern ~~obtained by the spatial pattern encoding method~~ is encoded in substantially independent wavelength bands ~~such as R, G and B~~.

15. (Currently Amended) A ~~3D image acquisition~~ method according to claim 14, wherein ~~blocks or~~ the wavelength bands are R, G and B and the local maximum areas ~~with local maximum luminance values~~ and the local minimum ~~luminance values~~ areas of each of R, G and B are aligned.

16. (Currently Amended) A 3D image acquisition method according to claim 14, wherein ~~blocks or~~ the wavelength bands are R, G and B and the local maximum areas ~~with local maximum~~

~~luminance values~~ and the local minimum ~~luminance values~~ areas of each of R, G and B are shifted.

17. (Previously Presented) A 3D image acquisition apparatus according to claim 3, wherein said plurality of color components are RGB components.

18. (Previously Presented) A 3D image acquisition apparatus according to claim 4, wherein said plurality of color components are RGB components.

19. (Currently Amended) A 3D image acquisition apparatus according to claim 2, wherein the ~~projected~~ predetermined pattern is one of a stripe pattern ~~or~~ and a matrix pattern.

20. (Currently Amended) A 3D image acquisition apparatus according to claim 3, wherein the ~~projected~~ predetermined pattern is one of a stripe pattern ~~or~~ and a matrix pattern.

21. (Currently Amended) A 3D image acquisition apparatus according to claim 4, wherein the ~~projected~~ predetermined pattern is one of a stripe pattern ~~or~~ and a matrix pattern.